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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,405	02/13/2002	Mario Meggiolan	Q68479	3986
3624	7590	05/31/2005	EXAMINER	
VOLPE AND KOENIG, P.C. UNITED PLAZA, SUITE 1600 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103			FISCHER, JUSTIN R	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,405

Applicant(s)

MEGGIOLAN, MARIO

Examiner

Justin R. Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 20-23, 40-45, 47 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19, 24, 31-39, 46, 48 and 50-53 is/are rejected.
- 7) ☒ Claim(s) 25-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 25, 2005 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 51-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original disclosure describes the inclusion of end flanges 7,9 to axially contain the ends of the pre-formed tubular body (Page 9, Lines 1-3) and further teaches that helical springs 21 elastically press the core elements against each other so that said elements are kept in contact (Page 9, Lines 15-25). The original disclosure, though, is silent as to the application of a pressure against the tubular body by the end flanges. Furthermore, there is no description regarding the

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benefits of minimized axial expansion (of the tubular body)- the above noted language simply suggests that the tubular body is confined by the end flanges (acts as a boundary). It is emphasized that the original disclosure only describes the inclusion of elastic springs that press against the elements of the core and as such, the claims are seen to constitute new matter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-14, 16-19, 24, 31-39, 46, 48, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo (US 5,246,275, of record) and further in view of Anderson (US 2,794,481, of record). Arredondo and Anderson are applied in the same manner as set forth in the Final rejection mailed on Arredondo is directed to a lightweight bicycle tire construction formed by the following method: (a) providing an inflatable (expandable) mandrel having a rim portion, a spoke portion, and a hub portion, (b) wrapping a number of fabric layers having a plastic material matrix around each of the portions noted above to form a layered tubular body, (c) placing the thus covered mandrel in a mold, (d) increasing the temperature of the mold to cure the plastic material while the mandrel is inflated/expanded (this step applies pressure to the layers and compresses them against the mold surface), and (e) removing the layered tubular body from the mold and the mandrel (Column 5, Lines 10-30). In this instance,

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the method of Arredondo uses an inflatable bladder to apply tension to the fabric layers (e.g. bladder is inflated and fabric layers are pressed against mold). Alternatively, however, it is well recognized in the composite industry that a solid, expandable core or bladder can be used to provide the desired expansion, as shown for example by Anderson (Column 1, Lines 50-65 and Column 2, Lines 10-13), such that the expandable core expands due to the application of heat (as opposed to expandable bladder that expands due to inflation). In particular, Anderson suggests that the use of a solid, expandable core/bladder eliminates the problems commonly associated with inflatable cores/bladders and thus provides one of ordinary skill in the art at the time of the invention with ample motivation to modify the method of Arredondo. Lastly, while Anderson does not expressly suggest the manufacture of composite wheel hubs, a fair reading of Anderson suggests that the use of a solid, expandable core, in place of an inflatable core, is more broadly directed to the manufacture of composite articles in which a plurality of fabric layers are arranged on an expandable (solid or inflatable) core or bladder.

It is initially noted that applicant has not challenged the examiner's previous position that inflatable mandrels and solid, expandable mandrels are recognized alternatives in the manufacture of composite articles (see Non-Final Rejection- Page 11).

Regarding claim 2, as noted above, the plastic material is cured at an elevated temperature while the layers are compressed against the mold surface (temperature and pressure are simultaneously applied).

As to claim 3, the fabric layers are compressed against the mold surface (radial direction).

With respect to claim 4, Arredondo includes a cooling step after the plastic material is cured (Column 6, Lines 50-51).

As to claims 5, 6, and 46, Arredondo is directed to a method of making a bicycle wheel having a hub, wherein multiple layers of fiber fabric are arranged on an inflatable mandrel. In describing the mandrel, Arredondo suggests that it is formed of a "high temperature resistant elastic material" (Column 12, lines 32-38) since the curing step occurs at a high temperature. The exemplary example of Arredondo has a curing temperature of about 180 degrees Celsius (Column 12, Lines 61-65), which suggests that the mandrel has a heat resistance of at least 80 degrees Celsius. As to the dilation coefficient, one of ordinary skill in the art at the time of the invention would have recognized the language "highly elastic material" of Arredondo as suggesting materials having a dilation coefficient in accordance to the limitations of the claimed invention. It is noted that Anderson describes a wide variety of solid, expandable cores in which the thermal coefficient of expansion is always greater than $5 \times 10^{-5} \text{ }^{\circ}\text{C}$ (Column 2, Lines 69-71). Thus, the use of a material having a dilation coefficient greater than 5×10^{-5} , more preferably greater than 9×10^{-5} , would have been obvious to one of ordinary skill in the art at the time of the invention since these values define highly expandable/elastic materials and such materials are desired in the method of Arredondo, there being no conclusive showing of unexpected results to establish a criticality for a material having the claimed dilation coefficient. Furthermore, the claimed values for the thermal

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expansion coefficient appear to be consistent with those commonly used in the manufacture of composite articles.

Regarding claims 7 and 8, Anderson evidences the well-known use of PTFE for the manufacture of expandable cores or bladders (Column 8, Lines 15-25).

As to claim 9, Arredondo suggests the use of a wide variety of fibers, including aramid fibers, carbon fibers, and glass fibers (Column 2, Lines 59-62).

Regarding claim 10, Arredondo describes the use of a wide variety of thermosets (Column 4, Lines 21-34).

With respect to claims 11-13, Arredondo describes an embodiment in which the composite is cured at a temperature of 177 degrees Celsius for about two hours. Furthermore, the reference suggests that the curing temperature and time varies as a function of the type of plastic material used (Column 12, Lines 60-65).

Regarding claims 14 and 16-19, Arredondo teaches a bicycle wheel construction having a rim portion, spoke portion, and hub portion. As depicted in Figures 1 and 3, the hub portion does not appear to be bell-shaped (cylindrical center section and two wider diameter ends). However, one of ordinary skill in the art at the time of the invention would have found it obvious to form the hub portion with such a shape because a majority of hubs are formed with wider diameter ends- while not depicted as such by Arredondo, this shape represents the most common hub construction in a large number of wheels, including bicycle wheels. It is noted that Arredondo states that the mold has a contoured surface that is shaped so as to impart the desired shape onto the tubular body, such that if a bell-shaped hub were desired, one of ordinary skill in the art

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at the time of the invention would have been able to form the mold with such a design.

This design is seen to constitute a hub in which there is a progressive increase in thickness from the center to the ends. Alternatively, the hub could be constructed with a less progressive or steeper increase in thickness as is required by claim 18, wherein each of the claimed designs would have been within the purview of one of ordinary skill in the art at the time of the invention depending on the desired aesthetic characteristics and desired function of the hub. Lastly, applicant has not provided any conclusive showing of unexpected results to establish a criticality for the claimed hub design.

With respect to claims 24-39 and 48, in the method of Arredondo, a plurality of fiber reinforced plies or layers are wrapped on a mandrel. Arredondo states that the layers can be unidirectional or they can be woven and further that the use of plies having a variety of orientations is preferred as set forth in Table 1. Arredondo also states that the layers can be cut to any desired shape (Column 13, Lines 60+). One of ordinary skill in the art at the time of the invention would have found it obvious to include layers in only some regions (layers are not continuous over entire extent of mandrel) in order to obtain a desired thickness. For example, if a larger thickness were desired in an end region as compared to a central region, additional layers would only be applied at the end regions. In particular, one of ordinary skill in the art at the time of the invention would have been able to apply the desired number of layers in certain regions to obtain the desired orientation and thickness. It is noted that the language of claim 24 is being viewed as requiring at least one layer that is only arranged over the core end portion and at least one layer that extends over the entire core axis.

As to claim 31, Table 1 of Arredondo describes the use of alternating plies.

Regarding claim 32-39, as noted above, one of ordinary skill in the art at the time of the invention would have been able to appropriately select the desired shape of each ply and the desired location of each ply. Table 1 shows the use of woven layers and unidirectional layers and further shows the use of alternating ply orientations.

As to claim 50, the claim is directed to the structure of the mold and fails to further define the method of the claimed invention. In this instance, each end of the mold in the hub portion can be viewed as an end flange.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo and Anderson as applied in claim 1 above and further in view of Barrier (US 5,192,384, of record). The method of Arredondo, in view of Anderson, includes the step of placing fabric layers on an expandable mandrel. In this instance, the mandrel would be expected to be a single piece mandrel. One of ordinary skill in the art at the time of the invention would have found it obvious to use a two-piece mandrel in the method of Arredondo since multi piece mandrels are commonly used in a wide variety of industries. For example, Barrier is similarly directed to the arrangement of fabric layers over a mandrel, wherein said mandrel can be solid and further can be formed of multiple pieces (Column 5, Lines 20-35). Thus, single and multi-piece mandrels are recognized as equivalent alternatives and one of ordinary skill in the art at the time of the invention would have readily appreciated either in the method of Arredondo absent any conclusive showing of unexpected results.

Allowable Subject Matter

6. Claims 25-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As noted in the previous office action, Arredondo suggests that the fabric plies can be cut in any desired shape; however, the reference fails to suggest the inclusion of cuttings and/or extensions to provide a uniform covering over the mandrel. In particular, the language of Arredondo is seen to generally suggest a ply having varying dimensions (e.g. widths and lengths) as opposed to the claimed arrangement in which a specific method step is carried out to provide cuttings and/or extensions in at least one lateral edge of a given fabric ply.

Response to Arguments

7. Applicant's arguments filed March 25, 2005 have been fully considered but they are not persuasive.

Applicant initially argues that the combination of Arredondo and Anderson is improper because Anderson provides a disparaging comment in regards to the use of an inflatable mandrel. The examiner respectfully disagrees. In fact, this is the exact reason why one of ordinary skill in the art at the time of the invention would have been motivated to modify the method of Arredondo with the solid, heat expandable mandrel (as opposed to an inflatable mandrel) of Anderson. Anderson recognizes the problems commonly experienced with inflatable mandrels and suggests processing improvements with the use of a heat expandable mandrel. In this instance, there is a reasonable

expectation of success in modifying the method of Arredondo with the mandrel of Anderson.

Applicant additionally argues that Anderson (a) does not teach the combination of a mold and a heat expandable mandrel and (b) teaches away from such a use because pressure applied to the resins could create abrasions and areas of weakness. First, the method of Arredondo does involve the placement of a mandrel within a mold- in modifying this method with Anderson, one of ordinary skill in the art at the time of the invention would have used a heat expandable mandrel in the existing method of Arredondo. In this instance, the heat of the mold would simultaneously expand the mandrel in an analogous manner to the claimed invention. It is emphasized that in practicing the method of Arredondo with a heat expandable mandrel, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the curing and expansion via heating the mold. Second, the problems noted by applicant are not in relation to the use of a heat expandable mandrel with a mold but rather result if the fiber layers are passed over a series of rollers or guides prior to being wound around said mandrel (Column 1, Lines 45-49).

Applicant further contends that the references are not properly combined because they are irrelevant to bicycle wheel hubs. First, the method of Arredondo expressly describes the use of a mandrel having a hub portion and thus, this reference is clearly directed to bicycle wheel hubs- the claims as currently drafted do not exclude the integral construction of Arredondo. Second, while Anderson is not directed to the manufacture of a wheel hub, the reference is similar in nature to that of Arredondo in

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that both references are directed to a method of laying fiber or fabric layers on a mandrel, wherein said mandrel generally expands or inflates to form a desired article. Furthermore, Anderson specifically recognizes the use of inflatable mandrels in such a method and suggests that heat expandable mandrels are preferred (over inflatable mandrels) due to processing difficulties with the former. Thus, one of ordinary skill in the art at the time of the invention would have had ample motivation to practice the method of Arredondo with a heat expandable mandrel as opposed to an inflatable mandrel.

Regarding claims 14-19, the issues have been addressed in the rejection of the respective claims above. In particular, one of ordinary skill in the art at the time of the invention would have found it obvious to form the hub portion with such a shape because a majority of hubs are formed with wider diameter ends- while not depicted as such by Arredondo, this shape represents the most common hub construction in a large number of wheels, including bicycle wheels. It is further noted that applicant has not directly challenged this position.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R. Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Justin Fischer

May 18, 2005